

WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device comprising the steps of:

- 5 forming a semiconductor layer on an insulating surface;
 forming an insulating film on said semiconductor layer;
 forming a first electrode comprising a lamination of a first conductive layer
 having a first width and a second conductive layer on said insulating film;
 forming a high concentration impurity region in said semiconductor layer by
10 adding an impurity element using said first electrode as a mask;
 forming a second electrode comprising a lamination of said first conductive
 layer having said first width and a second conductive layer having a second width by
 etching said second conductive layer of said first electrode;
 forming a third electrode comprising a lamination of a first conductive layer
15 having a third width and said second conductive layer having said second width by
 etching said first conductive layer of said second electrode; and
 forming a low concentration impurity region in said semiconductor layer by
 adding an impurity element through said first conductive layer or said insulating film
 using said second conductive layer as a mask.

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2. The method according to claim 1 wherein said second width is narrower than said first width.

3. The method according to claim 1 wherein said third width is narrower
25 than said first width and is wider than said second width.

4. The method according to claim 1 wherein, after a first conductive film and
a second conductive film are formed in a lamination on said insulating film, said
second conductive layer is formed by performing a first etching process with said
30 second conductive film, and said first conductive layer having said first width is
formed by performing a second etching process with said first conductive film,

whereby said first electrode comprising a lamination of said first conductive layer having said first width and said second conductive layer is formed.

5 5. The method according to claim 1 wherein said first conductive layer comprises TaN.

6. The method according to claim 1 wherein said second conductive layer comprises W.

10 7. The method according to claim 1 wherein said impurity element comprises phosphorus.

8. The method according to claim 1 wherein said semiconductor device is an electro-luminescence display device.

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9. The method according to claim 1 wherein said semiconductor device is one selected from the group consisting of a video camera, a digital camera, a projector, a goggle-type display, a car navigation, a personal computer, and a portable telephone.

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10. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor layer on an insulating surface;

forming an insulating film on said semiconductor layer;

25 forming a first electrode comprising a lamination of a first conductive layer having a first width and a second conductive layer on said insulating film;

forming a second electrode comprising a lamination of said first conductive layer having said first width and a second conductive layer having a second width by etching said second conductive layer of said first electrode;

30 forming a high concentration impurity region in said semiconductor layer by adding an impurity element using said second electrode as a mask;

forming a third electrode comprising a lamination of a first conductive layer having a third width and said second conductive layer having a second width by etching said first conductive layer of said second electrode: and

5 forming a low concentration impurity region in said semiconductor layer by adding an impurity element through said first conductive layer or said insulating film using said second conductive layer as a mask.

10 11. The method according to claim 10 wherein said second width is narrower than said first width.

12. The method according to claim 10 wherein said third width is narrower than said first width and is wider than said second width.

15 13. The method according to claim 10 wherein, after a first conductive film and a second conductive film are formed in a lamination on said insulating film, said second conductive layer is formed by performing a first etching process with said second conductive film, and said first conductive layer having said first width is formed by performing a second etching process with said first conductive film, whereby said first electrode comprising a lamination of said first conductive layer
20 having said first width and said second conductive layer is formed.

14. The method according to claim 10 wherein said first conductive layer comprises TaN.

25 15. The method according to claim 10 wherein said second conductive layer comprises W.

30 16. The method according to claim 10 wherein said impurity element comprises phosphorus.

17. The method according to claim 10 wherein said semiconductor device is

an electro-luminescence display device.

18. The method according to claim 10 wherein said semiconductor device is one selected from the group consisting of a video camera, a digital camera, a projector, a goggle-type display, a car navigation, a personal computer, and a portable telephone.

19. A method of manufacturing a semiconductor device comprising the steps of:

10 forming a semiconductor layer on an insulating surface;
 forming an insulating film on said semiconductor layer;
 forming a first conductive film and a second conductive film in a lamination on said insulating film;
 forming a second conductive layer having a first width by etching said
15 second conductive film;
 forming a high concentration impurity region in said semiconductor layer by adding an impurity element through said first conductive film or said insulating film using said second conductive layer having said first width as a mask;
 forming a first electrode comprising a lamination of a first conductive layer
20 having a second width and a second conductive layer having a third width by etching said first conductive film;
 forming a second electrode comprising a lamination of said first conductive layer having said second width and a second conductive layer having a fourth width by etching said second conductive layer of said first electrode;
25 forming a third electrode comprising a lamination of a first conductive layer having a fifth width and said second conductive layer having said fourth width by etching said first conductive layer of said second electrode; and
 forming a low concentration impurity region in said semiconductor layer by adding an impurity element through said first conductive layer or said insulating film
30 using said second conductive layer having said fourth width as a mask.

20. The method according to claim 19 wherein said second width is narrower than said first width.

21. The method according to claim 19 wherein said fifth width is narrower than said second width and is wider than said fourth width.

22. The method according to claim 19 wherein said first conductive layer comprises TaN.

23. The method according to claim 19 wherein said second conductive layer comprises W.

24. The method according to claim 19 wherein said impurity element comprises phosphorus.

25. The method according to claim 19 wherein said semiconductor device is an electro-luminescence display device.

26. The method according to claim 19 wherein said semiconductor device is one selected from the group consisting of a video camera, a digital camera, a projector, a goggle-type display, a car navigation, a personal computer, and a portable telephone.

27. A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor layer on an insulating surface;

forming an insulating film on said semiconductor layer;

forming a first conductive film and a second conductive film in a lamination on said insulating film;

forming a second conductive layer having a first width by etching said second conductive film;

forming a high concentration impurity region in said semiconductor layer by adding an impurity element through said first conductive film or said insulating film using said second conductive layer having said first width as a mask;

5 forming a second conductive layer having a second width by etching said second conductive layer;

forming an electrode comprising a lamination of a first conductive layer having a third width and said second conductive layer having said second width by etching said first conductive film; and

10 forming a low concentration impurity region in said semiconductor layer by adding an impurity element through said first conductive layer or said insulating film using said second conductive layer having said second width as a mask.

28. The method according to claim 27 wherein said second width is narrower than said first width.
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29. The method according to claim 27 wherein said third width is narrower than said first width and is wider than said second width.

30. The method according to claim 27 wherein said first conductive layer
20 comprises TaN.

31. The method according to claim 27 wherein said second conductive layer comprises W.

25 32. The method according to claim 27 wherein said impurity element comprises phosphorus.

33. The method according to claim 27 wherein said semiconductor device is an electro-luminescence display device.
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34. The method according to claim 27 wherein said semiconductor device is

one selected from the group consisting of a video camera, a digital camera, a projector, a goggle-type display, a car navigation, a personal computer, and a portable telephone.

- 5 35. A method of manufacturing a semiconductor device comprising the steps of:
- forming a semiconductor layer on an insulating surface:
 forming an insulating film on said semiconductor layer:
 forming a first conductive film and a second conductive film in a lamination
10 on said insulating film;
 forming a second conductive layer having a first width by etching said second conductive film;
 forming a high concentration impurity region in said semiconductor layer by adding an impurity element through said first conductive film or said insulating film
15 using said second conductive layer having said first width as a mask;
 forming an electrode comprising a lamination of a first conductive layer having a second width and a second conductive layer having a third width by etching said first conductive film and said second conductive layer: and
 forming a low concentration impurity region in said semiconductor layer by
20 adding an impurity element through said first conductive layer or said insulating film using said second conductive layer having said third width as a mask.
36. The method according to claim 35 wherein said third width is narrower than said first width.
- 25 37. The method according to claim 35 wherein said second width is narrower than said first width and is wider than said third width.
38. The method according to claim 35 wherein said first conductive layer
30 comprises TaN.

39. The method according to claim 35 wherein said second conductive layer comprises W.

— 40. The method according to claim 35 wherein said impurity element
5 comprises phosphorus.

41. The method according to claim 35 wherein said semiconductor device is an electro-luminescence display device.

10 42. The method according to claim 35 wherein said semiconductor device is one selected from the group consisting of a video camera, a digital camera, a projector, a goggle-type display, a car navigation, a personal computer, and a portable telephone.

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